



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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May 1, 2001

TO: Internal File

THRU: Jim D. Smith, Project Lead *JS*

FROM: Priscilla W. Burton, Soils Reclamation Specialist

RE: *JS* Ball Park Drainage Revisions, Co-op Mining Company, Bear Canyon Mine,
C/015/025-AM01A

SUMMARY:

On March 14, 2001 the Division received ditch designs to improve the conveyance of water from the cliffs above the Ball Park substitute topsoil pile to Bear Canyon Creek. The submittal also deletes the 3, 400 cubic yards of Ball Park substitute topsoil from the mining and reclamation plan. Elimination of the Ball Park substitute topsoil from the MRP is not recommended for the following reasons:

- The 1992 study of the soils within the disturbed area concludes that 4,100 yards of substitute soil resources are available from within the coal storage pad, assuming that the soils remain uncontaminated during the life of the mine as demonstrated by resampling five years before final reclamation.
- The 1992 soil study did not include analysis of the selenium, boron, hydrocarbon or acid/base accounting of the substitute soils.
- The reclamation plan (App. 3-L) indicates that material from a depth of 10 to 15 feet will be utilized, however, the soil within the coal storage pad was only sampled to a depth of 5 to 8 feet.
- Five inches of substitute topsoil will be redistributed over the entire site. This is a very minimal amount of topsoil. The native soils have about a foot of loam over subsoil. Rather than deleting this substitute topsoil resource, the mine operation should seek to preserve it.

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TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

Native soil types are identified on Plate 8-1 as Datino-Sheepcan-Winetti bouldery loams, 5 – 20% slopes (DZE) in the vicinity of the coal storage yard, and Travessilla-Rock outcrop Strych complex (TR) in the upper pad location. Appendix 8-B contains the 1980 soil survey.

Datino-Sheepcan-Winetti bouldery loams, 5 – 20% slopes (DZE)

In a typical profile of both the Datino and Sheepcan bouldery loams, the soil survey in Appendix 8-B indicates that above the B horizon there is about a foot of loam (page 8B-7). The narrative in Chapter 8 also indicates that there is a foot or more of loam in the surface layer. In the Datino profile, the four-inch topsoil layer is underlain by a seven-inch thick (B_w) loam layer which differs from the A horizon only in color and structure. The Sheepcan bouldery loam also has a five- inch topsoil layer underlain with an eleven-inch subsoil loam.

The Datino bouldery loam is classified as a loamy skeletal, mixed Typic Haploborall. The Sheepcan bouldery loam is classified as a fine-loamy, mixed (Calcareous), frigid Typic Ustorthent.

The Winetti is classified as Loamy-skeletal, mixed (calcareous), frigid, Typic Ustifluvents. It occurs along stream banks and is subject to flooding and erosion. As a result, a shallow topsoil horizon (one inch) lies over the recently deposited alluvium.

Rooting depth of these soils is approximately 60 inches and the available water capacity is 5 – 8 inches to a depth of 60 inches.

Travessilla-Rock outcrop Strych complex (TR)

The Travessilla very bouldery fine sandy loam occurs on ridges and side slopes. It is classified as a loamy mixed, calcareous, mesic, Lithic Ustic Torriorthent. The typical profile has a two-inch A horizon over the fine sandy loam C horizon and bedrock at approximately 14

inches.

The Strych soils are found in the draws and concave positions. Strych soils are loamy-skeletal, mixed, mesic Ustollic Calciorthids. They typically have a four-inch thick loam horizon over a four-inch (B_w) loam layer. A layer of clay accumulation (B_k) lies from 8 – 36 inches below. The C horizon extends to 60 inches.

Substitute topsoil

In 1985, 3,400 cubic yards of soil was imported to the mine site and stored in the "Ball Park." The soil was deposited over the 1.28 acres to a depth of 24 inches. Appendix 8-A contains the results of soil sampling of the ballpark substitute topsoil. Section 8.9.3 discusses the rationale for importing the substitute topsoil and concludes on page 8-31 with the statement, **"If reclamation can be completed without this material, the ball park will not be disturbed."**

In 1991 a search for other substitute topsoil (Section 8.9.1) identified the downcast material from the road cuts (App 8-A and 8-D); the "in-place" soil covered over by pad development (App 8-E); the reclaimed outslope of the coal storage pad (page 8-29). The in-place soils were sampled and analyzed (Appendix 8-E). The soil sampling conducted in 1991 of the substitute topsoil did not include analysis of acid/base accounting, selenium, or boron levels. These analyses have been standard for the use of overburden as substitute topsoil since the implementation of the Division's 1988 guidelines.¹

Most of these soils are buried beneath the operations pad, which is in continual use. Therefore, a commitment in the plan (page 8-29), states, **"Testing will be conducted again on the areas area [sic] to determine impacts continued mining has had on suitability in the final five year permitted period before reclamation."** The MRP does not indicate what analyses will be run at that time, but the Division requests that at that time, the buried soil is sampled and analyzed for selenium, boron, total organic carbon and acid/base accounting according to the methods described in Table 6 of the Division's 1988 Guidelines and as included in the MRP Table 3K-1 Analytical Parameters for Overburden. In addition, total petroleum hydrocarbons should be measured using EPA Methods 8015 for diesel fuel and 418.1 for waste oil.

The above two commitments (written in bold) seem to address the situation nicely. Removing the ballpark topsoil from the plan is pre-mature at this date.

¹ Leatherwood, James and Dan Duce. 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah. Department of Natural Resources. Division of Oil, Gas and Mining.

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Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

R645-301-234, Further define the commitment on page 8-29, Section 8.9.1, to state that the proposed substitute topsoil within the sediment pond embankments, upper and lower operations pads, in the vicinity of the scalehouse and shop will be tested in the final five years of operations according to Table 3K-1 (Analytical Parameters for Overburden) of the MRP and including Total Petroleum Hydrocarbons by EPA Methods 8015 and 418.1.

RECLAMATION PLAN

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-233, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

Appendix 3-L, Cut and Fill Calculations, page 3L-14, indicates that for a complete highwall recovery in section J-J' on the upper storage pad; section E-E' on the portal pad area; and section H-H' on the portal access and tippie access roads an additional 4,285 cubic yards of material will be hauled from the coal storage pad. An excess of 4,120 cubic yards will be generated from the grading of the coal storage pad and will be used for highwall elimination (Table 3L-2 and page 3L-14).

Table 3L-2 indicates that most of the substitute topsoil will be coming from the coal storage pad in the vicinity of stations 4 – 7. It appears from the cross-sections in Appendix 3-L that all the material in the cuts is considered to be suitable as substitute topsoil and there has been no identification of substitute topsoil being retrieved from a particular zone or depth within the pad. Such identification is required due to the variability in the analyses located in Appendix 8-E (discussed under Topsoil and Subsoil below). Once the available substitute topsoil is accurately identified, the usefulness of the Ball Park substitute topsoil can be evaluated.

Looking closely at the cross sections at stations 5, 6, and 7 and the corresponding Cut and Fill Reference Map, Figure 3L-1, one sees that the reclamation will reach outside of the disturbed area boundary to the stream to achieve the final outcome. This puts the reclamation work outside of the disturbed area boundary and to the perimeter of the permit area. Plate 3-2, Reclamation

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contours does not reflect this reach outside of the disturbed area boundary. This inconsistency between Plate 3-2 and Appendix 3-L must be reconciled.

Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

R645-301-233.100 and R645-301-542.200 In the backfilling plan, identify the location and depth of substitute topsoil material to be recovered from the grading cuts of the coal storage pad.

R645-301-512.120 and R645-301-542.300 and R645-301-521.140 Correct the inconsistency between Plate 3-2 and Appendix 3-L with regard to the disturbed area boundary and have the cross-sections in Appendix 3-L as well as Plate 3-2 certified by a registered, professional engineer or land surveyor.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

Redistribution

Page 8-38 indicates that five inches of topsoil or substitute topsoil will be redistributed over the entire site. This is a very minimal amount of topsoil replacement. As mentioned in the Appendix 8-B and discussed in this technical analysis in the Soils Resource Information section, native soils have about a foot of loam over the subsoil.

The details of the reclamation plan as presented in the MRP are sketchy. From Table 8.9-1, we know there will be 26 acres graded. If 5 inches of topsoil is replaced over 26 acres, then 17,450 cubic yards of topsoil will be necessary for reclamation. (If one foot of topsoil was replaced, there would be a need for 41,946 cubic yards.) The following yardage of topsoil has been segregated for reclamation:

1,000 cubic yards from the tank house road
+1,200 cubic yards from the shower house
<u>+1,480 cubic yards from the main topsoil pile</u>
3,680 cubic yards Total in storage

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Assuming the need for 17,450 cubic yards total, there is a topsoil deficit.

$$\begin{array}{r} 17,450 \text{ cubic yards required} \\ - 3,680 \text{ cubic yards in storage} \\ \hline 13,770 \text{ cubic yards deficit.} \end{array}$$

The Deficit of topsoil will be made up from reclamation areas as discussed below (see Plate 8-5 A - E for TS designation locations):

cubic yards
Deficit 13,770

TS 6, the portal access road outslope
(sampled down to 7 feet)

2.62 acres x 2 foot depth recovery = **8,454** cubic yards

Deficit 5,316

TS 5, the 10.8 acre coal storage pad and shop area
(sampled to a depth of 6 - 8 feet)

substitute material to come from the outer, eastern edge of the pad
the analysis show high EC and Mg levels in the top four feet at location CSP-1.
What is the planned recovery depth and volume to be generated from this location?

Table 3L-2, Appendix 3L indicates there may be **19,453** cubic yards of substitute topsoil to place over the 18,939 cubic yards of excess spoil. The determination of this figure needs some explanation. How is the substitute topsoil being differentiated from the rest of the fill? How is the yardage of spoil being estimated? In Appendix 3L, there appears to be no substitute topsoil generated from station 1, but this material represented by sample SP-1 was suitable as topsoil substitute (App 8-E).

Surplus +14,137

TS-3, sediment pond B (sampled to a depth of 2 feet)
and scale house (sampled to a depth of 5 feet)

This area may require additional topsoil as Sediment pond B (6-48 inch sample) had high EC and Mg values and Scalehouse soil samples had higher than average EC and SAR values in the top foot (see Appendix 8-E). These high values are not suitable as topsoil. They are comparable to the subsoil values found at undisturbed locations LB-1 through LB-3. Therefore, additional topsoil may be required for cover in TS-3.

Plate 8-5 B and C do not match in the vicinity of TS-3.

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TS-4, sediment ponds A embankments (sampled to a depth of 2 feet)

What is the planned recovery depth and volume to be generated from this location

Where is the boundary between TS-4 and TS-5 on Plate 8-5?

TS-7, the portal pad (sampled to a depth of 10 feet)

What is the planned recovery depth and volume to be generated from this location?

TS-8, the upper storage pad (sampled to a depth of 10 feet)

Appendix 3-L indicates that highwalls will require importation of fill from the lower coal storage pad.

What is the planned recovery depth and volume to be generated from this location?

TS-9, the showerhouse/office (sampled to a depth of 2 feet)

What is the planned recovery depth and volume to be generated from this location?

Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

R645-301-233.100 and R645-301-241 Using the information available, identify the planned recovery depth and volume of substitute topsoil to be generated from TS3 through TS 9 (TS designations are identified on Plates 8-5 A-E) and correlate this information with the cut and fill calculations laid out in Appendix 3-L.

R645-301-133.100 Plate 8-5 requires some work: Plate 8-5 B and C do not match in the vicinity of TS-3 and the boundary between TS-4 and TS-5 needs to be identified on Plate 8-5C.

RECOMMENDATION:

Details of reclamation are very sketchy at this time. The ballpark soils have already been moved to the site and vegetated and are available if needed for reclamation. In-situ soils have been tested for some but not all suitability parameters. In situ soils will be tested five years prior to final reclamation for suitability. Parameters to test for should include Boron, Selenium, Acid/Base Accounting, and Total Petroleum Hydrocarbons.

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There is an adequate amount of fill material to reclaim the site, however the reclamation plan does not adequately differentiate between spoil and substitute topsoil. The results of the 1991 soil sampling have not been utilized to identify and quantify the available substitute topsoil within the operations pad.

Five inches of substitute topsoil will be redistributed over the entire site. This is a very minimal amount of topsoil. The native soils have about a foot of loam over subsoil. Rather than deleting this substitute topsoil resource, the mine operation should preserve it. It appears to be pre-mature to remove the ballpark soils from the MRP. The amendment is not recommended for approval.

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